

Appln No. 09/747,677

Amdt date May 25, 2005

Reply to Office action of February 25, 2005

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-51 (Canceled)

52. (Previously Presented) A hyperlinked video broadcast system including a plurality of multiplexed video streams each having a plurality of video frames, said system comprising:

a mask generator generating a single mask including data for a plurality of mask overlays corresponding to a plurality of regions in one of said plurality of video frames; and

a receiver receiving viewer actuation of one of said plurality of mask overlays and switching from presenting to said viewer a first one of said plurality of multiplexed video streams to presenting to said viewer a second one of said plurality of multiplexed video streams in response to said viewer actuation.

53. (Previously Presented) The system of claim 52 wherein information associated with said viewer actuation is reported to a remote location via a backchannel communications connection.

54. (Currently Amended) The system of claim 52 wherein the data for said plurality of mask overlays comprise location and

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shape information of said plurality of regions in one of said plurality of video frames.

55. (Previously Presented) A hyperlinked video and audio broadcast system including a plurality of multiplexed video streams each having a plurality of video frames and including a plurality of multiplexed audio streams, said system comprising:

a mask generator generating a single mask including data for a plurality of mask overlays corresponding to a plurality of regions in one of said plurality of video frames; and

a receiver receiving viewer actuation of one of said plurality of mask overlays and switching from presenting to said viewer a first one of said plurality of multiplexed audio streams to presenting to said viewer a second one of said plurality of multiplexed audio streams in response to said viewer actuation.

56. (Previously Presented) The system of claim 55 wherein information associated with said viewer actuation is reported to a remote location via a backchannel communications connections.

57. (Previously Presented) The system of claim 55 wherein the data for said mask overlays comprise location and shape information of said plurality of regions in said plurality of video frames.

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58. (Previously Presented) A hyperlinked video reception system including a plurality of input multiplexed video streams each having a plurality of video frames, said system comprising:

a mask presenter processing a single mask including data for a plurality of mask overlays corresponding to a plurality of regions in one of said plurality of video frames and rendering the plurality of mask overlays;

a receiver receiving viewer actuation of one of said plurality of mask overlays,

wherein said receiver switches from presenting to said viewer a second one of said plurality of multiplexed video streams to presenting to said viewer a first one of said plurality of multiplexed video streams in response to said viewer actuation.

59. (Previously Presented) The system of claim 58 wherein information associated with said viewer actuation is reported to a remote location via a backchannel communications connections.

60. (Previously Presented) The system of claim 58 wherein the data for said mask overlays comprise location and shape information of said plurality of regions in said plurality of video frames.

61. (Previously Presented) A hyperlinked video stream switching data structure system having a plurality of video streams each including a plurality of video frames said system comprising:

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a plurality of video stream identifiers each associated with one of said plurality of video streams;

a single mask including data for a plurality of mask overlays corresponding to a plurality of regions in one of said plurality of video frames;

a first data structure element referenced by a set of said plurality of mask overlays;

a second data structure element referenced by said first data structure element, said second data structure element containing a reference to a first one of said plurality of video streams; and

a current video stream identifier corresponding to a second one of said plurality of video streams;

wherein actuation of said one of said plurality of mask overlays by a viewer causes said system to make said current video stream identifier correspond to said first one of said plurality of video streams.

62. (Currently Amended) The system of claim 61 wherein the data for said mask overlays comprise location and shape information of said plurality of regions in one of said plurality of video frames.

63. (Previously Presented) The system of claim 61 wherein said reference to a first one of said plurality of video streams references a third data structure element including references to an audio stream and a private data stream associated with said first one of said plurality of video streams.

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64. (Previously Presented) A method for switching between multiplexed video streams in a hyperlinked video broadcast system including a plurality video streams each having a plurality of video frames, said method comprising:

generating a single mask including data for a plurality of mask overlays corresponding to a plurality of regions in one of said plurality of video frames;

receiving viewer actuation of one of said plurality of mask overlays; and

switching from presenting to said viewer a first one of said plurality of multiplexed video streams to presenting to said viewer a second one of said plurality of multiplexed video streams in response to said viewer actuation.

65. (Previously Presented) The method of claim 64 further comprising reporting information associated with said viewer actuation to a remote location via a backchannel communications connection.

66. (Currently Amended) The method of claim 64 wherein the data for said plurality of mask overlays comprise location and shape information of said plurality of regions in one of said plurality of video frames.

67. (Previously Presented) A method for switching between multiplexed audio streams in hyperlinked video broadcast system including a plurality video streams each having a plurality of

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video frames and including a plurality of audio streams, said method comprising:

generating a single mask including data for a plurality of mask overlays corresponding to a plurality of regions in one of said plurality of video frames;

receiving viewer actuation of one of said plurality of mask overlays; and

switching from presenting to said viewer a second one of said plurality of multiplexed audio streams to presenting to said viewer a first one of said plurality of multiplexed audio streams in response to said viewer actuation.

68. (Previously Presented) The method of claim 67 further comprising reporting information associated with said viewer actuation to a remote location input via a backchannel communications connections.

69. (Currently Amended) The method of claim 67 wherein said mask overlays comprises location and shape information of said plurality of regions in one of said plurality of video frames.

70. (Previously Presented) A method for switching between video streams in a hyperlinked video reception system including a plurality of input multiplexed video streams each having a plurality of video frames, said method comprising:

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processing a single mask including data for a plurality of mask overlays corresponding to a plurality of regions in one of said plurality of video frames;

rendering the plurality of mask overlays;

receiving viewer actuation of one of said plurality of mask overlays; and

switching from presenting to said viewer a second one of said plurality of multiplexed video streams to presenting to said viewer a first one of said plurality of multiplexed video streams in response to said viewer actuation.

71. (Previously Presented) The method of claim 70 further comprising reporting information associated with said viewer actuation to a remote location via a backchannel communications connection.

72. (Currently Amended) The method of claim 70 wherein the data for said mask overlays comprises location and shape information of said plurality of regions in one of said plurality of video frames.

73. (Previously Presented) A method for switching between hyperlinked video streams in a hyperlinked video stream system having a plurality of video streams each including a plurality of video frames said method comprising:

generating a plurality of video stream identifiers each associated with one of said plurality of video streams;

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generating a single mask including data for a plurality of mask overlays corresponding to a plurality of regions in one of said plurality of video frames;

generating a first data structure element referenced by a set of said plurality of mask overlays;

generating a second data structure element referenced by said first data structure element, said second data structure element containing a reference to a first one of said plurality of video streams;

generating a current video stream identifier corresponding to a second one of said plurality of video streams;

receiving viewer actuation of said one of said plurality mask overlays; and

making said current video stream identifier correspond to said second one of said plurality of video streams in response to said viewer actuation.

74. (Currently Amended) The method of claim 73 wherein the data for said mask overlays comprise location and shape information of said plurality of regions in one of said plurality of video frames.

75. (Previously Presented) The method of claim 73 wherein said reference to a first one of said plurality of video streams references a third data structure element including references to an audio stream and a private data stream associated with said first one of said plurality of video streams.

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76. (Previously Presented) A hyperlinked video broadcast system including a plurality of multiplexed video streams each having a plurality of video frames, the system comprising:

means for processing a single mask including data for a plurality of image overlays corresponding to a plurality of objects in one of said plurality of video frames;

means for generating, in response to a user command, one of the image overlays visually identifying an object in a video frame;

means for receiving viewer actuation of the image overlay;
and

means for switching from presenting to a viewer a first one of the plurality of multiplexed video streams to presenting to the viewer a second one of the plurality of multiplexed video streams in response to the viewer actuation.

77. (Previously Presented) The system of claim 76, wherein each image overlay is associated with first timing data, presentation of the image overlay being synchronized with the video frame based on the first timing data.

78. (Previously Presented) The system of claim 77 further comprising a computer-readable medium storing computer program code that compares the first timing data with second timing data associated with a current video frame and sleeps for a period of time equivalent to a difference in times indicated by the first and second timing data, the computer program code being awakened

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for visually identifying the object based on the image overlay in response to an expiration of the time period.

79. (Previously Presented) The system of claim 76 further comprising:

a data store storing a data structure including annotation data associated with the object, the data structure being associated with second timing data indicative of a last instance the data structure is used in a video program associated with the video frame; and

means for removing the data structure from the data store in response to a determination based on the second timing data that the data structure is no longer used in the video program.

80. (Previously Presented) The system of claim 79 further comprising:

means for encoding the data structure and the single mask into a packet stream received by a receiver in the hyperlinked video broadcast system.

81. (Previously Presented) The system of claim 80 further comprising:

means for encoding the single mask and the data structure into a portion of the packet stream that is received prior to receipt of a portion of a video signal including the video frame.

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82. (Previously Presented) The system of claim 81, wherein a fixed number of packets is allocated to the single mask to be encoded into the packet stream, the fixed number of packets corresponding to a number of packets filled by a largest image data set to be encoded.

83. (Previously Presented) The system of claim 82, wherein a particular mask fills a particular number of packets that is less than the fixed number of packets.

84. (Previously Presented) The system of claim 83, wherein the data structure is encoded into the packet stream by identifying a first occurrence of the object associated with the data structure, and moving backwards in time from the first identified occurrence and filling one or more unused packets allocated to the particular image overlay data set with at least a portion of the data structure.

85. (Previously Presented) The system of claim 84, wherein the packet stream is received with a video stream over a broadcast signal.

86. (Previously Presented) The system of claim 84, wherein the packet stream is received out-of-band separately from a video stream including the video frame.

87. (Previously Presented) The system of claim 84, wherein the means for generating each image overlay further comprises:

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means for identifying on a first two-dimensional section containing a three-dimensional volume, a first region associated with the object, the first region including one or more first pixels;

means for filling the first region including the one or more first pixels with a predetermined value;

means for moving in a first direction along a third dimension to a second two-dimensional section containing the three-dimensional volume;

means for determining whether a second pixel in the second two-dimensional section that corresponds to a filled pixel in the first two-dimensional section belongs to the three-dimensional volume;

means for filling a second region including the second pixel in the second two-dimensional section with the predetermined value;

means for returning to the first two-dimensional section;
and

means for moving in a second direction along the third dimension to a third two-dimensional section containing the three-dimensional volume for filling a third region.

88. (Previously Presented) The system of claim 87, wherein each two-dimensional section is a video frame.

89. (Previously Presented) The system of claim 87, wherein the third dimension is time.